IN THE CLAIMS:

Please amend the claims of this application so as to read as follows:

1. (Currently Amended) A signal receiver receiving and demodulating a reception signal formed of a data symbol section where symbols are assigned in parallel to a plurality of subcarriers and modulated and a start symbol added ahead of said data symbol section, said signal receiver comprising:

a first memory ~~means (51) for storing~~ adapted to store N (N is an integer of 2 or more) types of reference signals, each corresponding to an arbitrary portion in said start symbol,

cross ~~correlation value calculation means (52, 53) for calculating~~ correlators adapted to calculate a cross correlation value between said reception signal and each of said N types of reference signals,

a peak position ~~detection means (54) for detecting~~ detector adapted to detect a peak position of each of the N cross correlation values calculated by said cross ~~correlation value calculation means~~ correlators,

a frequency offset estimation ~~means (55) for estimating~~ circuit adapted to estimate a frequency offset estimate value of a subcarrier of said reception signal for output, based on a cross correlation value at each of the N peak positions detected by said peak position ~~detection means~~ detector, and

a frequency offset ~~compensation means (37) for compensating~~ compensator adapted to compensate for a frequency offset of a subcarrier of said reception signal based on the frequency offset estimate value estimated by said frequency offset estimation ~~means~~ circuit.

2. (Currently Amended) The signal receiver according to claim 1, wherein said frequency offset estimation ~~means~~ circuit comprises

a phase rotation angle ~~calculation means (56) for calculating~~ calculator adapted to calculate a phase difference of cross correlation values at each of said N peak positions,

a second memory ~~means (57) for storing~~ adapted to store reference data based on a phase rotation angle between cross correlation values corresponding to said N types of reference signals under a state where a particular frequency offset is present, and

a divider ~~means (58) for dividing~~ adapted to divide the phase difference of cross correlation values calculated by said rotation angle ~~calculation means~~ calculator by said reference data to calculate said frequency offset estimate value.

3. (Currently Amended) The signal receiver according to claim 1, wherein said frequency offset compensation ~~means~~ circuit compensates for a frequency offset by rotating the phase of a subcarrier of said reception signal based on said estimated frequency offset estimate value.

4. (Currently Amended) The signal receiver according to claim 1, further

comprising a detector ~~means for detecting~~ adapted to detect said reception signal, including a local oscillator,

wherein said frequency offset compensation ~~means~~ circuit comprises ~~means for variable controlling~~ a variable-controller adapted to variable-control an oscillation frequency of said local oscillator based on said estimated frequency offset value.

5. (Currently Amended) A signal receiver receiving and demodulating a reception

signal formed of a data symbol section where symbols are assigned in parallel to a plurality of subcarriers and modulated and a start symbol added ahead of said data symbol section, said signal receiver comprising:

a first memory ~~means (51) for storing~~ adapted to store N (N is an integer of 3 or more) types of reference signals, each corresponding to an arbitrary portion in said start symbol,

cross ~~correlation value calculation means (52, 53,61) for calculating~~ correlators adapted to calculate a cross correlation value between said reception signal and each of said N types of reference signals,

a peak position ~~detection means (54) for detecting~~ detector adapted to detect a peak position of each of the N cross correlation values calculated by said cross ~~correlation value calculation means~~ correlators,

a frequency offset estimation ~~means (65) for estimating and averaging~~ circuit adapted to estimate and average a plurality of frequency offset estimate values of a subcarrier of said reception signal for output, based on a cross correlation value at each of the N peak positions detected by said peak position ~~detection means~~ detector, and

a frequency offset ~~compensation means (37) for compensating~~ compensator adapted to compensate for a frequency offset of a subcarrier of said reception signal, based on the frequency offset estimate value estimated and averaged by said frequency offset estimation ~~means~~ circuit.

6. (Currently Amended) The signal receiver according to claim 5, wherein said

frequency offset estimation ~~means~~ circuit comprises

a plurality of phase rotation angle ~~calculation means (56,66) for calculating~~ calculators adapted to calculate phase differences of a plurality of predetermined combinations of cross correlation values at respective ones of said N peak positions,

a second memory ~~means (57,67) for storing~~ adapted to store a plurality of reference data based on a plurality of phase rotation angles between cross correlation values corresponding to said plurality of predetermined combinations of said N types of reference signals under a state where a particular frequency offset is present,

a plurality of ~~divider means (58, 68) for dividing~~ dividers adapted to divide a plurality of phase differences of cross correlation values calculated by said plurality of rotation angle ~~calculation means~~ calculators by respective corresponding ones of said plurality of reference data to calculate a plurality of frequency offset estimate values, and

an averager adapted to average ~~averaging means (69) for averaging~~ a plurality of frequency offset estimate values from said plurality of ~~divider means~~ dividers for output.

7. (Currently Amended) The signal receiver according to claim 5, wherein said

frequency offset compensation ~~means~~ circuit compensates for a frequency offset by rotating the phase of a subcarrier of said reception signal based on said estimated and averaged frequency offset estimate value.

8. (Currently Amended) The signal receiver according to claim 5, further comprising ~~detector means for detecting~~ a detector adapted to detect said reception signal, including a local oscillator,

wherein said frequency offset compensation ~~means~~ circuit comprises ~~means for variable-controlling~~ a variable-controller adapted to variable-control an oscillation frequency of said local oscillator based on said estimated and averaged frequency offset estimate value.

9. (Currently Amended) A signal receiver receiving and demodulating a reception signal formed of a data symbol section where symbols are assigned in parallel to a plurality of subcarriers and modulated and a start symbol added ahead of said data symbol section, said signal receiver comprising:

a first memory ~~means (101,102) for storing~~ adapted to store N (N is an integer of 2 or more) types of reference signals, each corresponding to an arbitrary portion in said start symbol,

cross ~~correlation value calculation means (105,106) for calculating~~ correlators adapted to calculate a cross correlation value between an applied first signal and each of said N types of reference signals,

a peak position ~~detection means (114) for detecting~~ detector adapted to detect a peak position of each of the N cross correlation values calculated by said cross ~~correlation value calculation means~~ correlators,

a frequency offset estimation ~~means (107) for estimating~~ circuit adapted to estimate a frequency offset estimate value of a subcarrier of said first signal applied to said cross ~~correlation value calculation means~~ correlators for output, based on a cross correlation value at each of the N peak positions detected by said peak position ~~detection means~~ detector, and accumulating the frequency offset estimate values,

a phase ~~rotation means (108) for rotating~~ rotator adapted to rotate a phase of a subcarrier of an applied second signal based on the frequency offset estimate value estimated by said frequency offset estimation ~~means~~ circuit,

a second memory ~~means (104) for storing~~ adapted to store said second signal whose phase is rotated by said phase ~~rotation means~~ rotator,

~~control means for executing~~ a controller adapted to execute once a first control operation of applying said reception signal to said cross ~~correlation value calculation means~~ correlators as said first signal and to said phase ~~rotation means~~ rotator as said second signal to accumulate frequency offset estimate values of a subcarrier of said reception signal, and rotating the phase of the subcarrier of said reception signal for storage in said second memory ~~means~~, and repeating (N – 1) times a second control operation of applying the signal stored in said second memory ~~means~~ to said cross ~~correlation value calculation means~~ correlators as said first signal and to said phase ~~rotation means~~ rotator as said second signal to accumulate frequency offset estimate values of a subcarrier of the signal stored in said second memory, and rotating the phase of the subcarrier of the signal stored in said second memory for storage in said second memory ~~means~~, and

a frequency offset compensation ~~means (110) for compensating~~ circuit adapted to compensate for a frequency offset of the subcarrier of said reception signal based on an added value

of N frequency offset estimate values accumulated by said first and second control operations.

10. (Currently Amended) The signal receiver according to claim 9, wherein said frequency offset compensation ~~means~~ circuit compensates for a frequency offset by rotating the phase of the subcarrier of said reception signal based on the added value of said frequency offset estimate values.

11. (Currently Amended) The signal receiver according to claim 9, further comprising a detector ~~means for detecting~~ adapted to detect said reception signal, including a local oscillator,

wherein said frequency offset compensation ~~means~~ circuit comprises ~~means for variable-controlling~~ a variable-controller adapted to variable-control an oscillation frequency of said local oscillator based on the added value of said frequency offset estimate values.

12. (Currently Amended) A signal receiver receiving and demodulating a reception signal formed of a data symbol section where symbols are assigned in parallel to a plurality of subcarriers and modulated and a start symbol added ahead of said data symbol section, said signal receiver comprising:

a first memory ~~means (211) for storing~~ adapted to store N (N is an integer of 2 or more) types of reference signals, each corresponding to an arbitrary portion in said start symbol, and a plurality of reference data based on a phase rotation angle between cross correlation values corresponding to a plurality of sets of said reference signals, each set formed of two or more types of said reference signals, under a state where a particular frequency offset is present,

cross ~~correlation value calculation means (205,206) for calculating~~ correlators adapted to calculate a cross correlation value between an applied first signal and respective reference signals of each said set,

peak position ~~detection means (209) for detecting~~ detector adapted to detect a peak position of each cross correlation value calculated by said cross ~~correlation value calculation means~~ correlators,

a second memory ~~means (212) for extracting and storing~~ adapted to extract and store a portion of said reception signal,

a frequency offset estimation ~~means (206) for estimating~~ circuit adapted to estimate a frequency offset estimate value of said first signal applied to said cross ~~correlation value calculation means~~ correlators for output, based on a cross correlation value at each peak position detected by said peak position ~~detection means~~ detector and reference data corresponding to said reference signal of said each set,

an adder ~~means (214) for accumulating~~ adapted to accumulate the frequency offset estimate values output from said frequency offset estimation ~~means~~ circuit,

a phase ~~rotation means (207) for rotating~~ rotator adapted to rotate a phase of said reception signal stored in said second memory ~~means~~, based on the frequency offset estimate value estimated by said frequency offset estimation ~~means~~ circuit,

~~control means for executing~~ a controller adapted to execute a first control operation of applying said reception signal to said cross ~~correlation value calculation means~~ correlators as said first signal to calculate a cross correlation value with respective reference signals of a set corresponding to the smallest reference data of said plurality of reference data, and estimating a frequency offset estimate value of said reception signal by said frequency offset estimation ~~means~~ circuit based on the calculated cross correlation value and said smallest reference data, and for repeating a second control operation of applying said reception signal whose phase is rotated based on said estimated frequency offset estimate value and stored in said second memory ~~means~~ to

said cross ~~correlation value calculation means~~ correlators as said first signal to calculate a cross correlation value with the set of reference signals corresponding to the smallest unused reference data from said plurality of reference data, and estimating a frequency offset estimate value of the signal stored in said second memory by said frequency offset estimation ~~means~~ circuit, based on the calculated cross correlation value and said smallest unused reference data, and

a frequency offset ~~compensation means (208) compensating~~ compensator adapted to compensate for a frequency offset of the subcarrier of said reception signal based on an added value of frequency offset estimates accumulated by said adder ~~means~~ and calculated by said first and second control operations.

13. (Currently Amended) The signal receiver according to claim 12, wherein said signal extracted from said reception signal and stored in said second memory ~~means~~ is said start symbol.

14. (Currently Amended) The signal receiver according to claim 12, wherein said frequency offset compensation ~~means~~ circuit compensates for a frequency offset by rotating the phase of a subcarrier of said reception signal based on the added result of said frequency offset values.

15. (Currently Amended) The signal receiver according to claim 12, further comprising a detector ~~means for detecting~~ adapted to detect said reception signal, including a local oscillator,

wherein said frequency offset compensation ~~means~~ circuit comprises ~~means for variable-controlling~~ a variable-contoller adapted to variable-control an oscillation frequency of said local oscillator based on the added value of said frequency offset estimate values.

16. (Currently Amended) A signal receiver receiving and demodulating a reception signal formed of a data symbol section where symbols are assigned in parallel to a plurality of subcarriers and modulated and a start symbol added ahead of said data symbol section, said signal receiver comprising:

a C/N ~~detection means (309) for detecting~~ detector adapted to detect a C/N of said reception signal,

a memory ~~means (302) for storing~~ adapted to store a data table identifying an optimum reference signal corresponding to the C/N of said reception signal,

reference signal ~~output means (303, 304) for providing~~ outputs adapted to provide N (N is an integer of 2 or more) types of optimum reference signals, each corresponding to an arbitrary portion in said start symbol, based on said data table according to said detected C/N,

a cross ~~correlation value calculation means (305, 306) for calculating~~ correlator adapted to calculate a cross correlation value between said reception signal and each of said N types of reference signals,

a peak position ~~detection means (307) for detecting~~ detector adapted to detect a peak position of each of the N cross correlation values calculated by said cross ~~correlation value calculation means~~ correlator,

a frequency offset estimation ~~means (308) for estimating~~ circuit adapted to estimate a frequency offset estimate value of a subcarrier of said reception signal for output, based on a cross correlation value at each of the N peak positions detected by said peak position detection means, and

a frequency offset ~~compensation means (301) for compensating~~ compensator adapted to compensate for a frequency offset of the subcarrier of said reception signal, based on a frequency offset estimate value estimated by said frequency offset estimation ~~means~~ circuit.

17. (Currently Amended) The signal receiver according to claim 16, wherein said frequency offset ~~compensation means~~ compensator compensates for a frequency offset by rotating the phase of the subcarrier of said reception signal based on said estimated frequency offset estimate value.

18 (Currently Amended) The signal receiver according to claim 16, further comprising ~~detector means for detecting~~ a detector adapted to detect said reception signal, including a local oscillator,

wherein said frequency offset ~~compensation means~~ compensator comprises ~~means for variable-controlling~~ a variable-controller adapted to variable-control an oscillation frequency of said local oscillator based on said estimated frequency offset estimate value.

19. (Original) A method of compensating for a frequency offset of a subcarrier of a reception signal in a signal receiver receiving and demodulating the reception signal formed of a data symbol section where symbols are assigned in parallel to a plurality of subcarriers and modulated and a start symbol added ahead of said data symbol section, said method comprising the steps of:

calculating a cross correlation value between said reception signal and each of N (N is an integer of 2 or more) types of reference signals, each corresponding to an arbitrary portion in said start symbol,

detecting a peak position of each of said N calculated cross correlation values,

estimating a frequency offset estimate value of a subcarrier of said reception signal for output, based on a cross correlation value at each of said N detected peak positions, and

compensating for a frequency offset of the subcarrier of said reception signal based on said estimated frequency offset estimate value.

20. (Original) A method of compensating for a frequency offset of a subcarrier of a reception signal in a signal receiver receiving and demodulating the reception signal formed of a data symbol section where symbols are assigned in parallel to a plurality of subcarriers and modulated and a start symbol added ahead of said data symbol section, said method comprising the steps of:

calculating a cross correlation value between said reception signal and each of N (N is an integer of 3 or more) types of reference signals, each corresponding to an arbitrary portion in said start symbol,

detecting a peak position of each of said N calculated cross correlation values,

estimating and averaging a plurality of frequency offset estimate values of the subcarrier of said reception signal for output, based on the cross correlation value at each of said N detected peak positions, and

compensating for a frequency offset of the subcarrier of said reception signal, based on said estimated and averaged frequency offset estimate value.

21. (Original) A method of compensating for a frequency offset of a subcarrier of a reception signal in a signal receiver apparatus receiving and demodulating the reception signal formed of a data symbol section where symbols are assigned in parallel to a plurality of subcarriers and modulated and a start symbol added ahead of said data symbol section, said method comprising:

a first control step, said first control step including the steps of

calculating a cross correlation value between said reception signal and each of N (N is an integer of 2 or more) types of reference signals, each corresponding to an arbitrary portion in said start symbol,

detecting a peak position of each of said N calculated cross correlation values,

estimating a frequency offset estimate value of the subcarrier of said reception signal, based on the cross correlation value at each of said N detected peak positions for output, as well as accumulating the estimated frequency offset estimate values,

rotating the phase of the subcarrier of said reception signal based on said estimated frequency offset estimate value, and

storing said phase-rotated reception signal,

said method further comprising a second control step, said second control step including the steps of

calculating a cross correlation value between said stored phase-rotated reception signal and each of said N types of reference signals,

detecting a peak position of each of said calculated cross correlation values,

estimating a frequency offset estimate value of the subcarrier of said stored phase-rotated reception signal for output, based on the cross correlation value at each of said N detected peak positions, as well as accumulating the estimated frequency offset estimate value,

rotating the phase of the subcarrier of said stored phase-rotated reception signal based on said estimated frequency offset estimate value, and

storing said phase-rotated reception signal,

said method comprising the steps of: repeating said second control step (N – 1) times after said first control step, and

compensating for a frequency offset by rotating the phase of the subcarrier of said reception signal based on an added value of the N frequency offset estimate values accumulated by said first and second control steps.

22. (Original) A method of compensating for a frequency offset of a subcarrier of a reception signal in a signal receiver receiving and demodulating the reception signal formed of a data symbol section where symbols are assigned in parallel to a plurality of subcarriers and modulated and a start symbol added ahead of said data symbol section, said method comprising:

a step of storing N (N is an integer of 2 or more) types of reference signals, each corresponding to an arbitrary portion of said start symbol, and a plurality of reference data based on phase rotation angles between cross correlation values corresponding to a plurality of sets of said reference signals, each set formed of two or more types of said reference signals, under a state where a particular frequency offset is present, and

a first control step, said first control step including the steps of

calculating a cross correlation value between said reception signal and respective reference signals of a set corresponding to the smallest reference data from said plurality of reference data,

detecting a peak position of each of said calculated cross correlation values,

estimating a frequency offset estimate value of the subcarrier of said reception signal, based on the cross correlation value at each of said detected peak positions and said smallest reference data for output, as well as accumulating the estimated frequency offset estimate values,

extracting and storing a portion of said reception signal,

rotating the phase of said stored reception signal based on said estimated frequency offset estimate value, and

said method further comprising a second control step, said second control step including the steps of

calculating a cross correlation value between said stored reception signal whose phase is rotated based on said estimated frequency offset estimate value, and respective reference signals of a set corresponding to the smallest unused reference data of said plurality of reference data,

detecting a peak position of each of aid calculated cross correlation values,

estimating a frequency offset estimate value of said phase-rotated stored reception signal for output, based on the cross correlation value at each of said detected peak positions and said smallest unused reference data, as well as accumulating the estimated frequency offset estimate values,

repeating said second control step after said first control step, and

compensating for a frequency offset by rotating the phase of the subcarrier of said reception signal based on an added value of the frequency offset estimate values accumulated by said first and second control steps.

23. (Original) A method of compensating for a frequency offset of a subcarrier of a reception signal in a signal receiver receiving and demodulating the reception signal formed of a data symbol section where symbols are assigned in parallel to a plurality of subcarriers and modulated and a start symbol added ahead of said data symbol section, said method comprising the steps of:

detecting a C/N of said reception signal,

storing a data table identifying an optimum reference signal corresponding to the C/N of said reception signal,

providing N (N is an integer of 2 or more) types of optimum reference signals, each corresponding to an arbitrary portion in said start symbol, based on said data table, according to said detected C/N,

calculating a cross correlation value between said reception signal and each of said N types of reference signals,

detecting a peak position of each of said N calculated cross correlation values,

estimating a frequency offset estimate value of the subcarrier of said reception signal for output, based on the cross correlation value at each of said N detected peak positions, and

compensating for a frequency offset of the subcarrier of said reception signal based on said estimated frequency offset estimate value.